

(12) INTERNATIONAL PUBLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
11 March 2004 (11.03.2004)

PCT

(10) International Publication Number
WO 2004/020774 A3

(51) International Patent Classification⁷: **E21B 43/1185**,
F42B 3/113, E21B 47/12

(21) International Application Number:
PCT/GB2003/003781

(22) International Filing Date: 29 August 2003 (29.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/407,074 30 August 2002 (30.08.2002) US

(71) Applicant (for all designated States except US): **SENSOR
HIGHWAY LIMITED** [GB/GB]; 8th Floor, South Quay
Plaza II, 183 Marsh Wall, London E14 9SH (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SMITH, David, R.**
[US/US]; 3100 Regent Street, Kilgore, TX 75662 (US).

RAMOS, Rogerio, T. [GB/GB]; 21 Taw Drive, Chandlers
Ford, Hampshire SO53 4SL (GB). **HARTOG, Arthur**
[CA/GB]; 31 Butterfield Road., Southampton SO16 7EG
(GB). **VAYNSHTEYN, Vladimir** [US/GB]; Springfields,
Manor Lane, Timsbury, Nr. Romsey, Hampshire, SO51
0NE (GB).

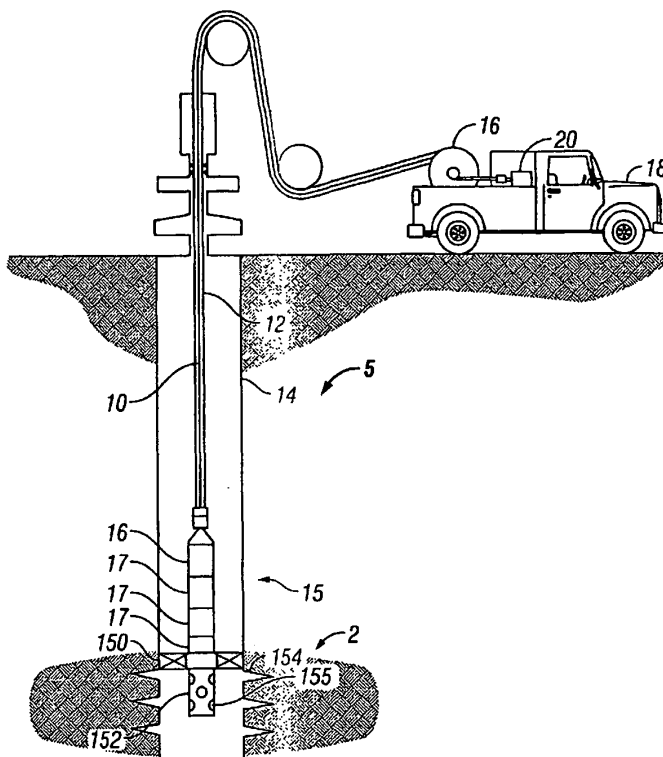
(74) Agent: **STOOLE, Brian, David**; Sensa, Gamma House,
Chilworth Science Park, Southampton SO16 7NS (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: METHODS AND SYSTEMS TO ACTIVATE DOWNHOLE TOOLS WITH LIGHT



(57) Abstract: The present invention comprises a system and methods to actuate downhole tools by transmitting an optical signal through an optical fiber (10) to the downhole tool (15). The optical signal can comprise a specific optical signal frequency, signal, wavelength or intensity. The downhole tool can comprise packers, perforating guns, flow control valves, such as sleeve valves and ball valves, samplers, sensors, pumps, screens (such as to expand), chemical cutters, plugs, detonators, or nipples.

WO 2004/020774 A3



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
22 April 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*